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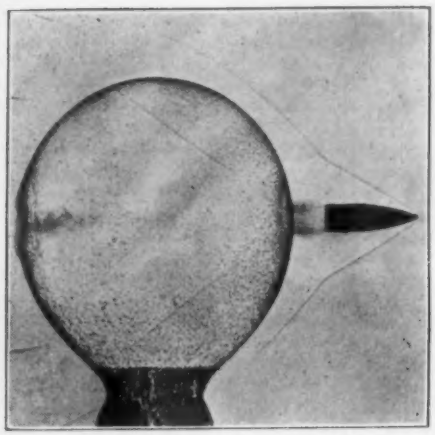
PHYSICS

Government Scientists Study Soap Bubbles



THE BULLET AND THE BUBBLE; photograph made in the Sound Laboratory of the U. S. Bureau of Standards by means of an electric spark, by Philip P. Quayle, showing a soap bubble through which a rifle bullet has been fired. The bullet has passed out of the bubble, but it still stands, with a hole in each side. The lines extending from the front of the bullet are sound waves

Have you ever studied a soap bubble? Perhaps when you were a child you were fond of playing with a dish of suds and a clay pipe, but the bubble is more than a toy, for grown up scientists at the U. S. Bureau of Standards in Washington have been studying them, even to the point of shooting bullets through them, and photographing them as they break.

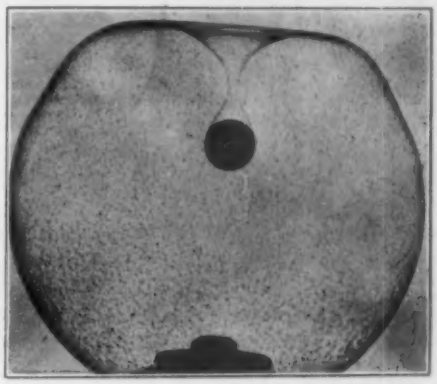
The photographing has been done by Dr. Philip P. Quayle, and uses light furnished by an electric spark, so that the bullet and half broken bubble are photographed as clearly as if they were at rest. And from these photographs it has been found that the bubble is not the simple thing that we used to imagine it, but some very complicated processes go on within its walls. Some of these are of considerable practical use, as in the mining industry, where they are used to separate precious metals from the ore.

Dr. Quayle's work has been in the sound laboratory of the Bureau, which is under the direction of Dr. Paul R. Heyl, whose studies along a different line in a subterranean vault under one of the Bureau's buildings have given a more accurate value of the mass of the earth.

The traditional material for bubbles is a soap solution. Every child knows that though bubbles may be formed in clear water they last but a fraction of a second. Soap, however, is not absolutely necessary for the production of a lasting bubble. The water of the sea is whipped by the wind and by its own motion into bubbles which may accumulate in heaps on the beach and last a long time. Carbonated beverages may produce a similar froth on a smaller scale. It appears to be a general rule that the formation of permament bubbles is possible only when the water contains organic matter of some kind, soap, glycerine, oils, vegetable extracts (as a seaweed in ocean water) or sugar and flavoring material, as in beverages. Quite small amounts of organic matter will impart to water film the requisite tenacity to produce a lasting bubble.

But the best of bubbles will not last forever, though some have been kept under glass for many hours. One of the most frequent causes of the death of a bubble is irritation by particles of dust, and when this is prevented the life of a bubble may be surprisingly long.

"When a bubble once gives way its complete disappearance is so rapid as to lead to the common impression that it is instantaneous," said Dr. Heyl. "The very rapid spark photographs taken of a breaking bubble by Dr. Quayle show that the bursting of a bubble is a progressive process, though a very rapid one. Photographs have been obtained of a bubble which has had a bullet fired through it. For a few millionths of a second (long enough to be photographed) the bubble stands as if in amazement with a hole in each side. The holes rapidly increase in size, the water film spraying off at the edges into fine drops, until in a thousandth of a second or so the bubble is gone.



STEEL BALL DROPPED INTO A SOAP BUBBLE. This photograph, made about a hundredth of a second after the ball first touched the bubble, shows that it has not yet begun to break, but extends down around the ball like an elastic membrane.

"One of the first things to catch the attention when a bubble has been successfully blown is the shimmering play of colors reflected from its surface. These colors, we notice, are formed somehow in the act of reflection of the colorless light of day from the surface of the bubble. It is possible, with a little practice, to detach the bubble from the pipe by which it was blown, and to catch it upon a piece of cloth, where it may remain for some time. If we closely examine the distribution of colors on such a quiet bubble we may be fortunate enough to see colored bands moving downward from the top of the bubble to the bottom. The north pole of the

(*Just turn the page*)

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Soap Bubbles

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bubble seems to be the storehouse whence the bubble draws these colors in succession. And if we are exceptionally lucky we may see at the north pole, just before the bubble breaks, a black spot. It is as if the store of colors had been exhausted.

"Why should the colors stop coming? And why does the bubble become black rather than clear and transparent? Is there any causal connection between the appearance of this black spot and the immediately following disappearance of the bubble?

"During the brief life of the bubble as it stands upon the cloth the liquid of which it is composed flows slowly downward by gravity, the top of the bubble becoming thinner. This thinning out can be followed by the downward motion of the bands of color, for each particular color corresponds to a certain definite thickness (or rather thinness) of the bubble, and moves steadily downward as the film above it thins out. The black spot represents a place of such extreme thinness that it can no longer reflect light to the eye. All the light that falls upon it passes through.

"It may be perhaps a new idea that anything can be so thin that it cannot reflect light; but the study of thin films such as found in bubbles teaches us that light is not reflected strictly from the surface of bodies, but that it must penetrate a very little way into the substance of the body itself before it can be turned and sent back. Like a motor car, the beam of light requires a little room in which to turn. And if this necessary turning space is not to be found, the light will not be able to turn at all, but will pass through the film and out at the other side.

"This is true in the case of bodies ordinarily considered to be opaque, such as polished surfaces of metal. But even metals are transparent in

(*Continued on page* 163)

News-Letter Features

Born over four years ago of the demand and interest of those individuals who had caught a glimpse of *Science Service's* news reports to newspapers, the SCIENCE NEWS-LETTER has since proved interesting to laymen, scientists, students, teachers and children.

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ZOOLOGY

Squirrels' Memory Tests

Do squirrels remember where they hide nuts? Or can they smell a nut hidden in the ground? Or do they sometimes just dig around and find something by chance, because so many squirrels have buried so many nuts in the squirrel neighborhood?

This squirrel puzzle is a live topic among naturalists.

The story of a red squirrel that buried nine nuts in the snow on a house balcony, and that came next day and carefully dug up the nine nuts, one by one, even though a new fall of snow complicated the problem, is told by Dr. A. Brooker Klugh, of Cornell University, in a report to the forthcoming issue of the *Journal of Mammalogy*. This incident, Dr. Klugh says, is proof of the red squirrel's remarkably strong memory for location. In many cases, there is a possibility that the sense of smell may help a squirrel to find hidden objects, he adds, but this time such assistance seems out of the question.

Dr. Klugh has studied red squirrels for eight years, and has watched individual squirrels over periods as long as two years.

He says: "Time after time, I have seen a squirrel go by the nearest route to something it has stored, take it out, and eat it."

Observations indicating that squirrels do not "smell out" buried nuts have been made by L. R. Dice, of the University of Michigan, and described in the same journal. A fox squirrel, which came regularly to be fed, was observed over a period of several months. The squirrel was fed in a shallow box on the house porch, and Mr. Dice filled it with sand and buried a number of nuts under the sand. The squirrel came frequently to the box, to eat nuts which were left for it on top of the sand. It sometimes dug around in the sand, and if a nut were partially buried with one end sticking up in sight, the squirrel would be likely to find it. But it never discovered a single completely buried nut. If no walnuts were in sight, it would hunt about, and leave without its dinner.

"If squirrels do not find buried nuts by use of the sense of smell," he states, "the presumption would be that they remember the place where they have buried each nut that they find. This would require a well developed memory, though not necessarily a perfect memory, for squirrels undoubtedly fail to find many nuts they have buried."

ARCHÆOLOGY

JAMES HENRY BREASTED

Digger in the Past

The discovery a few years ago of the tomb of King Tutankhamen focussed the attention of the world on Egyptian archæology. But Dr. Breasted has followed it since 1894, when he was appointed assistant in Egyptology at the University of Chicago. In the winter of 1894-95 he was in Egypt collecting for the University of Chicago. Since then he has spent pretty nearly all of his time the same way, and in 1925 the University relieved him of all teaching duties. This has enabled him to take full charge of the work of the University's Oriental Institute, of which he was made director in 1919.

All his work, however, has not been teaching and digging. In 1900, for instance, he found time to visit the European museums on a commission of the Royal Academies of Germany to copy and arrange the Egyptian inscriptions in these museums for an Egyptian dictionary. For a number of years he has been associate editor of the *American Journal of Semitic Languages*.

Dr. Breasted was born at Rockford, Ill., on the 27th of August, 1865, and in 1888 he finished his undergraduate studies at Northwestern College. Then he studied at the Chicago Theological Seminary, specializing in Hebrew. From there he went to Yale, taking a master's degree in 1892, and in 1894 he received his Ph.D. from the University of Berlin. Since that time he has received many honorary degrees, including the highly prized Doctor of Letters of Oxford University.

MEDICINE

To Publish Epidemic Record

Word of what may be an important step toward the solution of the influenza problem has just been received at the Surgeon General's office of the U. S. Public Health Service from Dr. Ludwih Rajchman, medical director of the health section of the League of Nations.

Health authorities all over Europe have been asked to start work on the preparation of a report for the League of Nations on the course of the present epidemic in each country, just as soon as the epidemic has subsided to the point where such research is practicable. It is hoped that by the prompt tabulation of this information the medical world will have some useful data to use in putting up defenses against the next epidemic.

The health officials will have their hands full checking up on all the details that are wanted concerning the intangible enemy. It is particularly desirable to know the geographical distribution of the disease, the time order in which it appeared in different districts, and the movement of contagion from week to week. Description of the clinical types of the disease at different periods and the kind and frequency of complications as well as the ages of the fatal cases are other points on which information is desired. Last but far from least will be a comparison of the bacteriological findings from cases in the different countries and the measures that the health officials have found the most successful in controlling the disease.

In spite of the vast amount of bacteriological work that has been done on the subject, medical science is still in the dark as to the cause of influenza. The complications like bronchitis and pneumonia that frequently follow have rendered the isolation of the germ causing primary influenza particularly difficult. The various vaccines that have been tried out have met with almost as much failure as success. Leaders in the medical profession admit that should a visitation of influenza assume the proportions and virulence of 1918, we should be as impotent to deal with it as we were then.

What Europe has learned that is new from her recent experiences with this much dreaded disease will be made available to the rest of the world with the publication of this report.

PHOTOGRAPHS OF SCIENTISTS

Science Service has a collection of nearly 2,000 photographs of scientists throughout the world. The sixth installment of this list is published below. Although this list has been checked with care, corrections are requested, since a complete catalog will be issued later. Photographs of scientists not listed are desired.

For the convenience of teachers and scientific enthusiasts, these photographs are offered for sale. Any ten photographs (each postcard size 3⅛ x5⅜ inches) will be sent postpaid for only $2.00. Enlargements, 8 x 10 inches, are $1.00 each postpaid. Postcard pictures are finished only in black and white, but enlargements are offered either in black and white or sepia on buff stock. Please specify which.

Starred (*) photographs can be furnished as $1.00 enlargements only. Photographs at these prices are sold with the understanding that they are not to be used for publication.

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ASTRONOMY

Comet to be Visible Soon

For the first time in a number of years a comet will be visible in the night sky a few months from now. The Pons-Winnecke comet, discovered at the Yerkes Observatory on March 3, will be less than four million miles away from the earth on June 26, according to Prof. George Van Biesbroeck, discoverer of the comet. At that time it will be visible to the unaided eye, he said. It will then be in the constellation of Aquarius, in the southeastern sky about midnight, and directly south about 3:00 a. m. Not far from it will be the bright star Altair, in the constellation of Aquila, the eagle, which can now be seen low in the eastern sky just before sunrise. At present, the comet is in the constellation of Bootes, near the bright star Arcturus, which is now in the southern sky in the early morning hours.

Though the Yerkes Observatory has in its equipment the largest refracting telescope in the world, with a lens 40 inches in diameter, the comet was discovered with a much more modest instrument. This is a reflector, in which a concave mirror replaces the convex lens of the refractor, with a mirror only 24 inches in diameter. With the greater light grasping powers of the reflector, however, it is possible to photograph fainter objects with the smaller instrument than can be seen with the big one. The comet was found on photographs made with the reflector, and appeared as a tiny round patch of nebulosity of the sixteenth magnitude. The human eye can not see objects fainter than about the fifth magnitude.

From now on, and for as long as it continues to be visible, the comet will be under the scrutiny of Prof. Van Biesbroeck and the other astronomers here. These observations will be intended to determine the position of the comet accurately, so that its future wanderings may be more accurately charted. Since it was here last, six years ago, when it did not approach nearly as close as it will now, it has been subjected to perturbations by the gravitational attraction of Jupiter and other bodies, which are very difficult to compute, and so its exact position on its present return could not be predicted precisely.

Other observations planned at the Yerkes Observatory will measure the comet's brightness, and still others, by means of the spectroscope, which analyzes its light, will determine its composition. The tail, which will appear as the comet approaches nearer the sun, is known to consist largely of carbon monoxide, a deadly gas frequently produced on earth as a product of incomplete combustion of coal or other fuel.

Science News-Letter, March 12, 1927

CHEMISTRY—ECONOMICS

Gold or Index Price?

A chemist, turning from his careful reading of a technical journal article telling of the latest work upon the transmutation of base metal into gold, delved into a description of a new issue of bonds.

"Safeguarded as to purchasing power of both principal and interest" was the claim. And reading further, the chemist discovered that the value of the principal and the interest to be paid are not to be firmly fixed to the dollars and cents that presumbaly have their roots in gold, but are to vary with the prices of commodities. When living is dear, the bonds will be worth more and pay more interest in dollars and cents; when things are cheaper, less interest will be paid and the principal value in dollars decreases. The index number of wholesale prices as issued by the United States Bureau of Labor Statistics each month governs the quarterly interest payments. Let the "zero" index number of 157.5 rise 10 per cent. to 173.25, and the interest payment will jump from $17.50 to $19.25.

Can it be that the bankers and financial experts have more confidence in the practical fulfillment of the alchemist's dream than chemists themselves? asked the chemist. Do they expect that Miethe, Germany's modern alchemist, and Nagaoka, Japan's claimant to transmutation fame, will be able to take the lead of commerce and the power of coal or water and produce the yellow dirt upon which the financial system of the world rests?

The chemist thought of the minute grains of gold and the immense power necessary to produce them. Then he remembered the vast fluctuations in the value of money that man-made war and disturbed economic conditions had caused since 1914. And he concluded that it was financial and not chemical knowledge that had led the bankers to hitch their bonds to a commodity index number.

Science News-Letter, March 12, 1927

ZOOLOGY

Mystery of Bird Migration

Bluebirds, meadow larks and robins are arriving daily from the savannahs of the South, but scientists are as much in the dark as ever over why they do it. The reason at the bottom of the long, long trek that the denizens of our backyards take twice a year is a mystery that can be little more than guessed at, according to Dr. Alexander Wetmore, president of the American Ornithologists' Union.

"The entire act of migration is so utterly complex that no single factor may be ascribed as the absolute cause," he declares. Dr. Wetmore, who is also assistant secretary of the Smithsonian Institution, believes that migration has arisen from movements induced by seasonal and climatic changes until it has become a hereditary instinct that is now actuated by physiological causes.

In a recent book on bird migration, Dr. Wetmore has attempted to correlate the findings of ornithologists of the past 200 years with his own field observations in both North and South America. Around 3,000 feet is the average height attained by migrating birds, he says, since flight becomes difficult above that point.

The greatest recorded speed for a bird is held by the common swift of Eurasia, which was observed from an airplane to be jogging along at 70 miles an hour in normal flght. The smaller perching birds fly from 20 to 37 miles an hour, while ducks and geese range from 42 to 59 miles.

Science News-Letter, March 12, 1927

AGRICULTURE

Heating Alfalfa Seed

Alfalfa seeds, troublesome to farmers for years because a certain percentage of them have such hard, impermeable coats that water has a hard time getting through to make them germinate, can be conquered by heating before they are planted. Miss Anna M. Lute, of the Colorado Experiment Station, has worked this subject over a period of fifteen years. She tried a considerable number of temperatures, but found the most effective to be 167 degrees Fahrenheit, at which 94 per cent. of the seeds were rendered permeable to water. Temperatures below 122 degrees, even when continued for as much as eight hours, had little ffect on impermeable seeds. Tests of heated seeds after five months' storage showed no loss of vitality.

Science News-Letter, March 12, 1927

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Say you saw it advertised in the SCIENCE NEWS-LETTER

Soap Bubbles

(*Continued from page* 158)

thin enough layers, as is evidenced by ordinary gold leaf.

"In penetrating the reflecting surface to this minute depth certain qualities characteristic of the reflecting material are impressed upon the light, so that by examining the reflected beam, even many miles away from the reflecting body, we can tell something about the material of the reflector. In fact certain scientists have attempted to gain by this means some idea of the different materials composing the surface of the moon. The moon shines by reflected sunlight, and the idea is that the light reflected from different areas of the moon's surface may, by its characteristically altered quality, betray the nature of the material which has reflected it.

"How thin is this black spot in a bubble, and what sets a limit to it? Why cannot a bubble thin out indefinitely? These questions lead to one of the most interesting things which a bubble can teach us. Water is made up of molecules, particles so inconceivably small that a soap bubble when freshly formed may be many molecules thick. But as the film thins out it is gradually reduced to a thickness of but a few molecules; and obviously this process cannot go on forever. The film cannot be less than one molecule thick. Any further thinning out is bound to break it.

"Now it is possible from the colors exhibited by thin films to obtain an idea of their thickness; and the black spot on the bubble cannot be thicker than the value indicated by the last color that made its appearance from this place. If the black spot be but one molecule thick, such a molecule cannot be greater in diameter than this critical thickness. This sets a superior limit to the size of a watery molecule, for if the black spot is two or three molecules thick, the molecules must be still less in size than this limit. Under no circumstances can they be greater.

"Other and different lines of experiment set an inferior limit to the size of a molecule. Jointly such results have led us to the conclusion that if a drop of water were to be magnified to the size of the earth the molecules of which it is composed would be in size between that of a baseball and a piece of small shot.

"Another curious and instructive thing about a bubble is its tendency to contract. If after a bubble be blown the mouth be removed from the pipe, the bubble will contract, even though the pipe be inverted so that

(*Just turn the page*)

DR. PAUL R. HEYL, head of the Sound Laboratory at the U. S. Bureau of Standards, in Washington, who tells of some of the wonders of the soap bubble. Dr. Heyl has also been engaged in a long series of researches to determine the exact force of gravity.

PHYSIOLOGY

Measure Dance Energy

Hostesses should lay in a heavy supply of refreshments, when they expect to entertain guests who like to display their Charleston proficiency. An account of an exhaustive survey of the energy consumed in dancing made by a group of Scandinavian scientists at the Physiological Institute of the University of Helsingfors, sets down in precise figures the number of calories used in different kinds of dances.

The waltz went to the bottom of the list with 3.99 calories used per hour per kilogram of body weight. The schottische, beloved of grandfather and grandmother, scored .02 of a point below the modern foxtrot, using 4.76 calories while the latter required 4.78. The polka, another institution of grandmother's day, needed 7.56 calories an hour, while the mazurka, evidently the fastest dance the learned Scandinavians could get anyone to practice for them, took 10.87 calories, or almost twice the amount of energy consumed by a stonecutter plying his trade.

It obviously remains for some American research worker to find out the number of calories that need to be supplied to devotees of the Charleston and the Black Bottom.

CHEMISTRY

New Element in Pure Form

Rhenium, the chemical element whose discovery was recently announced by Doctors Walter and Ida Noddack, has now been obtained in pure form. The first discovery was based on the finding of the characteristic lines in the X-ray spectrum as detected by photographic plates, but now the Noddacks have succeeded in obtaining, after long and difficult refining processes, a small quantity of the substance itself. They describe it as a black powder of high melting-point, that unites readily with a number of other elements. In an atmosphere of pure oxygen it ignites, forming a white oxide. The quantity so far obtained is very minute, only two milligrams, or seven one-hundred-thousandths of an ounce, and the experimenters are now at work to elaborate more of it which will permit of exact quantitative chemical examination.

ENGINEERING

Sweden Uses Peat

A new source of wealth has been found in the peat bogs of Sweden which heretofore have usually been regarded as so much waste land. Unlike the people of Ireland, the Swedish inhabitants have always had plenty of wood to use as household fuel, so that peat has only rarely been used for the purpose. On the other hand, Sweden lacks coal mines and in recent years there have been performed many experiments with peat as substitute and now the head of the Swedish peat industry, Lieutenant Herman Ekelund, declares that a peat powder can be produced by machinery, capable of creating any given degree of heat cheaper than coal, and in more convenient form. With peat as a fuel, he claims that iron ore can be reduced in small electrical ovens. Compared with charcoal, the peat powder costs but one half and if the iron thus produced is not of such high quality, it is better than if made with coke. With peat temperatures as high as 2,200 degrees centigrade have been attained.

An advantage of the new methods of exploiting the peat bogs is that the dugover area is not left flooded, but can be worked as farmland after suitable drainage. Where farming is not advantageous, as in the northern parts of Sweden, where it is too cold, forests can be planted and regular lumber crops raised.

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Soap Bubbles

(*Continued from page* 163)

the bubble hangs downward. Sometimes this contraction may be so rapid and forcible that the air issuing from the stem of the pipe will blow out a small flame.

"A striking way of showing this contractile property is by the use of a glass funnel. If the funnel be submerged in the soap solution so as to wet it thoroughly on the inside, and then raised carefully by the stem a flat soap film may be seen stretching across the opening of the funnel. So strong is this tendency of the film to contract that it will run up the funnel, lifting its own weight in the process.

"Every liquid acts as though it were encased in a stretched elastic skin. Liquids in quantities such as are ordinarily handled do not show this property because so much of them is inside and so little on the outside, and the surface properties are masked by the properties characteristic of the inside. But a soap film is nearly all surface, and very little inside, and the contractile property of the surface becomes evident. This contractile property (surface tension is its scientific name) is responsible for a great many happenings in nature. It is the cause of the globular shape of a dew drop, of a rain drop, of water sprinkled on a dusty floor; it causes the ascent of oil in a lamp wick and is responsible for the absorbent property of a towel or of blotting paper. It governs the curious changes of shape in that wonderful little speck of protoplasm called the amoeba, and it is suspecting of having much to do with the contraction of a muscle."

But bubbles are useful in every-day life. "They play an important part in modern mining industry," said Dr. Heyl. "Often the valuable mineral is mixed with much rock from which it must be separated. Various methods of concentration are employed to effect this purpose. One which has been developed in comparatively recent years makes use of bubbles to this end. The mineral bearing rock is crushed to a powder and stirred up in water to which a very small amount of a special oil is added. The agitation of this mixture produces a froth of bubbles which rises to the surface, each of these little bubbles bearing attached to itself a particle of mineral, while the worthless rock is left at the bottom of the liquid. This froth is skimmed off, and a valuable concentrate obtained from it. This process is called flotation, and is one of the most important of modern developments in the art of mining.

"And the moral of all this is, as the Duchess might have remarked to Alice, that there is nothing in Nature so simple and commonplace as to be unworthy of our serious attention. Even the evanescent bubble leads us to such unexpected extremes as the winning of valuable minerals by the ton and the determining of the size of the molecules which constitute matter, and which we can never hope to see. The bubble is all things to all men; the toy of the child, the figure of speech of the poet, and the object of the careful study of the scientific man."

Science News-Letter, March 12, 1927

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SCIENCE SERVICE
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Children do not develop color sense until about two years, a psychologist finds.

The U. S. Naval Observatory has been furnishing time for this country for over 92 years.

Fossils of mackerel have been found that date back to the Eocene period, perhaps 100 million years ago.

A Spanish vessel, laden with oils, that caught fire in New York burned 50 days before firemen finally conquered the flames.

ENTOMOLOGY

Grasshoppers Menace

Toasted grasshoppers! Will this delicacy become, of necessity, the main part of the daily menu of people from southern Argentina to northern Mexico?

For the past four years, tropical migratory grasshoppers have descended in tremendous hordes upon this region, bearing destruction with them to all vegetation in places where they alight. They do their work as thoroughly as enemy invaders that burn the fields behind them. A horde of these grasshoppers will consume practically everything edible in sight in ten minutes. They come in such swarms that they actually obscure the sun for seconds at a time. In addition to their devastating work upon vegetation they often prevent transportation, making the rails dangerously slippery with their body fat.

So serious have been the recent plagues that archeologists are beginning to realize that here lies a possible explanation of the migrations of ancient American civilizations. Grasshopper plagues like the recent ones might easily have caused the abandonment of magnificent Mayan cities for new places unmolested by these food-consuming pests. Or perhaps the Mayas ate the grasshoppers, as it is known that inhabitants of certain parts of Africa and Asia do.

But before the culinary art of modern peoples of the infested regions is required to include the making of tasty dishes of grasshoppers, it is hoped that some method will be devised to prevent the return of such plagues.

The state of Vera Cruz in Mexico has enlisted the services of Dr. Carlos C. Hoffman to discover the source of these dangerous grasshopper migrations. He believes that they probably originate in the zone about Lake Peten in Guatemala. Cooperation of neighboring republics in further investigation of this region would, Dr. Hoffman feels, be of great benefit. Once the breeding places of these grasshoppers are discovered, the pest could, perhaps, be stopped at its source.

The increase of natural enemies of these grasshoppers is another hopeful sign, says W. R. Walton of the U. S. Bureau of Entomology. There is a parasitic swift-flying two winged fly which overtakes the grasshoppers in flight and deposits maggots on their backs. The maggots at once begin eating into the bodies of the grasshoppers. Due to the increase of these parasite flies a waning in the severity of grasshopper plagues can be expected soon, Mr. Walton says. Another natural check to the pest is found in some beetles native to the infested region which lay their eggs in the grasshopper egg nests. The parasites hatch first and feed upon the grasshopper eggs.

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BIOLOGY

Bermuda Biological Station

Arrangements for cooperation between American, Canadian and British scientists in the development of an international laboratory for marine biological research at Bermuda have just been completed, it is announced by a committee headed by Prof. E. G. Conklin of Princeton University. These islands, which lie 700 miles southeastward from New York and about the same distance directly east of Charleston, are ideally situated for the study of subtropical sea animals and plants, it is pointed out; and their easy accessibility, only 48 hours sail from New York, makes the location of the station here especially convenient for students who lack either the time or funds for an expedition into regions farther south. Biological work on a considerable scale has been conducted here for a number of years on more or less informal basis, and the effort will now be made to unify and coordinate these activities and to make the advantages of the station better known and more available to biologists.

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SOCIOLOGY

Parasitized, Says Inge

"We are not yet a degenerate people but we are not in healthy condition," the very Rev. W. R. Inge, dean of St. Paul's, told members of the Royal College of Physicians in a recent lecture on social degeneration.

Unless the problem of racial decay is taken in hand promptly, the Dean fears that it may be too late and accordingly registers an appeal to the medical profession to do their share to stem the tide of general social debility.

Machinery has transformed a skilled into an unskilled population and modern workers are parasitic on the machine which has ousted them from natural human occupations, the noted divine declared. With this disastrous change has come the growth of antisocial movements, both anarchistic and parasitic. Dole receivers, representing an acute social problem of England that has grown up since the war, were scored as an example of this parasitic attitude.

"Society," he continued, "may become like the majestic sunfish, its scales covered with lice, its intestines one tangled mass of tapeworms, its eyes pierced by trematodes, no organ of its body free from swarming masses of parasites. And it may not be easy to recall the parasites to healthy social habits."

The most immediate way of helping, according to the Dean, will be to persuade people how pressing these social problems really are.

"The great medical societies," he declared, "can do much, if they will speak out. I do not think they quite realize how glad the public would be to listen to them. The modern man may deny that he has a soul, and forget that he has a mind; but he is acutely conscious that he has a body, and therefore he has a great respect for the doctors."

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ENTOMOLOGY

Bee Eugenics

No longer will the scientific beekeeper permit his choice, blooded stock of queen bees to fly out of sight up into the heavens and mate with drones of unknown stock, coming back, perhaps, to introduce an unwanted mixture into his hives. Dr. Lloyd R. Watson, of Alfred, N. Y., has devised a method for mating queen bees by artificial means.

Hitherto, the queen breeder had no direct control over the male parentage of his stock, but had to trust to chance that his Italian queen bee would mate with a drone of as good stock as herself. Dr. Watson, after years of persistent effort, has solved the problem. He placed a virgin queen bee in a strange sort of bed, snared and tied with many loops of silk, an unwilling bride. A drone was sacrificed on the altar of his race and the mating was artificially effected.

Queen bees, thus inseminated, have laid eggs naturally, and are now heading hives of their own. Hitherto, no matter how valuable any queen proved herself to be, the strain would soon be dissipated through uncontrollable matings with low-caste native males. Now, the breeder who has a queen heading a colony that produces hundreds of pounds of honey in a season, can mate her daughters with drones from another colony of equally good productivity, and thus keep his stock up to standard as effectively as do the breeders of cattle or horses.

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MINERALOGY

Hold Jade Precious

Sophisticated jade earrings that are a necessary decoration of sleek evening coiffeurs are a modern symptom of the jade madness that has possessed China for centuries. The feminine taste for the green quartz of Asia has become so keen that a celebrated London firm recently started working its own jade quarry in Burma.

Though its home is in northern Burma and Turkestan jade is called Chinese because the grinding and carving is all done in China. The Chinese are the only masters of this industry because jade has always been esteemed by them as the "quintessence of heaven and earth," the most precious of precious stones.

The earliest use of jade was almost purely ritualistic and symbolical according to R. L. Hobson, curator of the department of ceramics and ethnography at the British Museum. It was a royal stone and kings were wont to exchange cities or towns for a single piece. It was one of

(*Just turn the page*)

MEDICINE

Baldness Baffles Science

Hopeful bald men who pin touching faith to the hair restorer bottle on the bathroom shelf can never hope for the hirsute glory that was Samson's. For the alopecious thousands that pant for more hair the American Medical Association and the U. S. Public Health Service recommend a good tonic, message, and a dandruff antiseptic mixture of alcohol and castor oil. These measures that have the stamp of medical approval may conserve what hair a man has already, but they are cold comfort to the really bald. For sure-enough baldness there is no cure except upon rare occasions.

Nor has science been more successful in unearthing the cause of baldness. One German authority believes that it may be a secondary male sex character. Consequently a man has more call to blame his parents than his wife when he begins to see his scalp appear through his departing locks. Nervous conditions have something to do with it, it is generally agreed, and occasionally syphilis is the guilty agent. Other physicians have conjectured that baldness is due to some disturbance of the endocrine glands. This observation is based on the fact that salts of the rare metal thallium which produces endocrine disturbances will also produce baldness. No form of endocrine treatment, however, that has

(*Just turn the page*)

SOCIOLOGY

High Chinese Death Rate

China, with its swarming millions of people, its crowded streets and villages, has a very low rate of population increase in recent years, largely because of the great proportion of deaths. This fact is shown by a new study of Chinese censuses since 1741, made by a Chinese government statistician, Chang-heng Chen.

In 1741, the Chinese people numbered only about 25 millions more than the United States population of today, and in the 50 years following 1741 the population more than doubled, advancing at the rate of 15 per 1,000 people every year. In the next half century, the population increase slowed down to less than five additions a year to each 1,000 people. From 1849 down to 1923, the rate of addition has gone down to only .81 per thousand. This, Mr. Chang says, is lower than the rate of population advance in any other country except France.

"The rate of increase of nations of the white race since 1800 has been 11 per 1,000," he says. "This means

(*Just turn the page*)

BIOLOGY

Sex Extract of Flowers

The much-quoted aphorism of Kipling, that "the Colonel's lady and Judy O'Grady are sisters under their swin," is capable of a much wider extension, to include all living female beings, both animal and plant, if results reported by Prof. Bernhard Zondek, of the University of Berlin, may be taken as a criterion. For he has shown that female animals, rendered sexually inactive by surgical operations, have their missing instincts restored to them by extracts taken from the female organs of plants. His most powerful vegetable "love potion" was extracted from the pistillate catkins of willows, which are purely female flowers, but he also obtained results when he used an extract taken from water lilies. This latter experiment calls to mind the poetic legend of the birth of Buddha, whose mother, according to an old Indian tradition, conceived at the touch of a lotus flower. Prof. Zondek has obtained his results only with extracts made from the sexual parts of plants extracts from the vegetative portions are without effect.

Two other physiologists, Prof. Dohrn and Dr. Faure, of Vienna, state that they have performed similar experiments with an extract of yeast,

(*Just turn the page*)

BIOLOGY

NATURE RAMBLINGS

By Frank Thone

Early Dandelions

Poets, rhapsodizing over the coming of spring, sing of violets and crocuses and snowdrops and daffydowndillies but strangely neglect the dandelion. Yet this touseled towhead is among the earliest of flowers, impudently showing its undesired face in all sorts of places exposed to the rawest winds, if only the sun shines strongly there. In fact, March dandelions might well serve as a kind of large-scale soil thermometer, to point out the patches that warm up first. You find a line of them nestling along the lee of a house, or even in the slight shelter of a raised sidewalk. And where a group of buildings is heated from a central boiler plant with radiating pipe lines under ground, their course is marked plainly on the surface by zones of yellow bloom.

These early dandelions resemble their later successors of the close-clipped lawns of summer, in that their stems are short. Long stems belong to the long-grass period, and to dandelions trapped in partial shade, which is uncongenial to their kind. Shortness of stem seems to be linked up with free access of light, and possibly also with higher evaporating power of the air; though these are only guesses — nobody really knows why as yet.

It may seem queer that these flowers go right on and form normal heads of seed, when there are no insects about to carry the fertilizing pollen. The secret is, that though dandelions form pollen they never use it, but produce their seeds without the formality of fertilization, after the weird fashion of plant-lice and water-fleas, that regularly bring forth fatherless offspring.

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Production of rayon, or artificial silk, now surpasses that of real silk.

A sensitive instrument which measures the poisonous carbon monoxide gas released by automobiles has been devised by government chemists, and may be used in vehicular tunnels.

Do You Know That—

The temperature of a warm blooded animal when hibernating is almost the same as its cold surroundings.

The average length of life of negroes in this country is 46 years, while that of white people is 54 years.

An Ohio chemist finds that we eat only one-third as many foods high in vitamins as we ought at the average meal.

A series of 20 lessons were recently broadcast by one teacher to over 250,000 children in New England schoolrooms.

Helium mixed with oxygen forms an atmosphere as breathable as ordinary air, and is being used in diving and tunneling activities.

Chemical engineers in Africa find that the euphorbia tree, so abundant in that country, produces rubber which might be commercialized.

Parchment paper is paper from which all the air has been driven out and the pores filled with a preparation, usually colloidal cellulose.

Government scientists have produced disks with a surface so flat that it differs from a true plane by less than two ten-millionths of an inch.

Static electricty which can be generated in the human body has been sufficient to start fires in the presence of alcohol or gasoline vapors.

The University of California is experimenting with quick methods of removing the pucker from slowly ripening Japanese persimmons.

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Chinese Death Rate

(*Continued from page* 167)

that the rate of increase of the Chinese population in modern times has been not quite one-third as fast as that of other countries."

The Chinese population reached the 400,000,000 mark back in 1835, according to the census figures. Since that time it has advanced only to 438,370,000, and the statistician believes that this extraordinarily slow rate of advance is due to high death rates rather than to low birth rates. China does not need any large increase of population at present, he adds, but high death rates are not healthy factors.

Census figures before 1741 in China were misleading, Mr. Chang shows, because the head count included only males between 16 and 60 years and it was taken with the primary purpose of levying taxes. These taxes were lower in sparsely settled communities. Hence, Chinese population figures were often strangely low.

After 1741, both males and females of all ages were counted, Mr. Chang states.

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Flower Sex Extract

(*Continued from page* 167)

which is a microscopic plant that normally reproduces without any sexual process whatever.

These rejuvenation experiments on females by means of various extracts are regarded here as of great importance, inasmuch as the female glandular mechanism is far less susceptible to surgical treatment such as the Steinach operation, than are the sex glands of males, hitherto the only beneficiaries of scientific efforts to restore youth. Glandular extracts provocative of sex reactions in the male, analagous to those already well known for female reactions, have so far been unobtainable; so that surgical treatment for males and glandular extract treatment for females are regarded as having reciprocal value.

Science News-Letter, March 12, 1927

The only practical method of reducing static in radio is said to be the use of some kind of antenna system which receives more strongly from one direction than from another.

Records of the northern Great Plains Weather Bureau station in North Dakota show that frost has occurred as late as June 3 and as early as August 23.

Chinese Jade

(*Continued from page* 167)

the oldest commodities of trade and for this reason the best has never been exported but is reserved for the trade in China itself.

Many of the finest pieces have been taken from tombs while the badges of princes of royal blood were always jade. Gold was the material used for those of officers of only the third and fourth rank. The artists of China have long lavished full play of their decorative fancy on the translucent stone which was also administered in powdered form by Chinese physicians to their patients.

It is first mentioned in English History when Sir Walter Raleigh brought what was called a kidney stone from the West Indies, from its supposed properties for curing disorders of the kidneys. It is conjectured that this piece of jade reached the Western World by way of Spaniards who probably had it from the East.

Science News-Letter, March 12, 1927

Baldness

(*Continued from page* 167)

been used so far has been of any use in growing a cover for a shiny dome.

Irradiation with roentgen rays does no good and exposure to ultra-violet light is of very little use. In short, science does not know why the bald are bald, and there is little the bald man can do about it but cultivate a cheerful disposition.

Science News-Letter, March 12, 1927

Argentina's worst insect crop pest is a locust like the large flying grasshoppers of the United States.

A Japanese railroad engineer has perfected a method of detecting dangerous flaws in rails by magnetism.

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First Glances at New Books

CHEMICAL ENGINEERING ECONOMICS—Chaplin Tyler—*McGraw-Hill* ($3.50). An attempt to help advanced chemical engineering students bridge the abrupt gap separating classroom instruction from practice in the industrial plant.

Science News-Letter, March 12, 1927

PROCRUSTES or The Future of English Education—M. Alderton Pink—*Dutton* ($1). This volume asks pertinent questions about the efficacy and value of our present educational system.

Science News-Letter, March 12, 1927

THE FUNDAMENTALS OF CHEMISTRY — L. Jean Bogert — *Saunders* ($2.75). A text book on chemistry designed to meet the needs of nurses and some economics students.

Science News-Letter, March 12, 1927

THE SCIENCES, A Reading Book for Children—Edward S. Holden—*Ginn* ($.84). Designed to help the child to understand the material world about him. May it save his long suffering parents from concocting answers to a few less questions.

Science News-Letter, March 12, 1927

A HISTORY OF MEDICINE—C. G. Cumston—*Knopf* ($5). An outline of the development of medicine from pre-Hippocratic times to the present, illustrated with cuts of many rare portraits of early medical leaders.

Science News-Letter, March 12, 1927

FERTILIZERS, Their Sources, Manufacture, and Uses—Herbert Cave—*Pitman* ($1). A brief discussion, in popular language, of the merits of various fertilizers, grouped according to their chemical classes.

Science News-Letter, March 12, 1927

STUDIES OF CHOLERA IN JAPAN—Rokuro Takano, Itsuya Ohtsubo and Zenjuro Inouye—*Health Organization of the League of Nations.* The most important results of investigations on Asiatic cholera conducted in Japan summarized in English for the benefit of Western research workers.

Science News-Letter, March 12, 1927

A BIBLIOGRAPHY OF THE ANALYSIS AND MEASUREMENT OF HUMAN PERSONALITY UP TO 1926—Grace E. Manson—*National Research Council* ($1). A useful and well organized bibliography of 1,364 books and articles from a wide range of sources.

Science News-Letter, March 12, 1927

THE ORIGIN OF BIRDS—Gerhard Heilman — *Appleton* ($7.50). The reptilian ancestry of birds is proved several times both with logic and the copious illustrations that decorate this handsome volume. A valuable addition to the ornithologist's library.

Science News-Letter, March 12, 1927

A SURVEY OF AMERICAN CHEMISTRY (Vol. 1)—Edited by William J. Hale—*Chemical Catalog Co.* ($2.50). Leading chemists tell of the progress of chemistry in the United States during the past year.

Science News-Letter, March 12, 1927

HYDROGEN ION CONCENTRATION, Vol. 1. The Theoretical Principles—Leonor Michaelis, translated by William A. Perlzweig of Johns Hopkins—*Williams and Wilkins* ($5). The last word on a subject of great importance to chemists and biologists.

Science News-Letter, March 12, 1927

MANUAL OF METEOROLOGY, Vol. 1—Sir Napier Shaw — *Cambridge* (30s.). One of the world's most eminent meteorologists tells of the history of weather science in a complete and interesting manner.

Science News-Letter, March 12, 1927

OXFORD MEETING—*British Association for the Advancement of Science* (25s.). This is in effect a yearbook of British science, containing the presidential addresses, abstracts of papers, and extensive references to the program of the meeting of last summer.

Science News-Letter, March 12, 1927

DIMINISHING RETURNS IN AGRICULTURE—F. Lester Patton—*Columbia University* ($1.50). A cool and factual examination of a part of the economic field at present more characterized by heat than by light.

Science News-Letter, March 12, 1927

A BIBLIOGRAPHY OF AMERICAN NATURAL HISTORY, Pioneer Century, 1769-1865 — Max Meisel — *Premier* (Vol. I. $5; Vol. II, $7.50). These two volumes give first an extensive bibliography of bibliographies, and then an annotated listing of all early journals, proceedings and other publications in which the papers of the Homeric age of American natural history appeared.

Science News-Letter, March 12, 1927

GAS AND GASES—R. M. Caven—*Holt* ($1). An elementary account of the chemical, physical and biological aspects of gases.

Science News-Letter, March 12, 1927

Scientific Poetry Prizes

The second weekly scientific poetry prize has been awarded to Richard Ashman of New Orleans. His poem, telling of the Dodo's Dolorous Doom, is given in this column. It will be seen that Mr. Ashman has made a striking combination of paleontology, eugenics and homiletics: an accomplishment hardly possible to science written in prose. Similar syntheses bringing together remote coners of the wide field of knowledge and tempered with poetry should be entered in the Science Service Scientific Poetry Contest.

Conditions: Poems, verses, rimes, jingles or what-have-you must be original and unpublished. They must express accurately some scientific fact or situation. Address: Poetry Editor, Science Service, 21st and B Sts., Washington, D. C. Keep a copy, as unavailable contributions can not be returned.

Prizes: One poem will be published each week. A prize of $5.00 will be paid for each poem published.

BIOLOGY

The Dodo's Dolorous Doom

This week's prize winning poem in the Science Service scientific poetry contest.

On the Island of Mauritius
In the southern Indian Sea,
Lived a Bird, so unsuspicious,
Unprogressive, unambitious,
That his fate was unpropitious—
Tragical in high degree.

Dodo was this Bird's cognomen,
Insular his habitat;
Yet he couldn't flee his foeman,
Couldn't swim to dodge the bowman,
Dead is he as any Roman:
You are not surprised at that.

Let me say in this connection,
Such ineptness cannot thrive!
Dodo had no predilection
For Darwinian selection;
This accounts for his defection,
For his failure to survive.

Let your tears augment the ocean,
Let their salt increase the brine;
Give full vent to your emotion,
If you only get the notion
That your duty is devotion
To survival of your line.

—*Richard Ashman.*

Science News-Letter, March 12, 1927

Government tests of auto tires show that, within the customary limits of air pressure used in tires, the higher the pressure the better the tire will stand up.

How to Use Key-Word Feature of News-Letter

In order to aid in catching the items that concern you and to facilitate clipping and filing, a key word in small capitals has been printed on the right of the line above each article. The key words used fit into any system of classification, whether it be a straight alphabetical file, a system of your own devising, the Library of Congress classification or the Dewey system.

Note that you can clip out any article without fear of damaging another article in which you might be interested, since editorial matter printed on the righthand pages is backed by advertising, standing matter or a continuation of the article on the other side.

Library of Congress Classification

The classification of the Library of Congress has come into common use in the libraries of the country owing to the publication of the Government of the card index of all new books. We print below a list of the subject titles which are most used in the SCIENCE NEWS-LETTER. The full scheme of classification is contained in "Outline Scheme of Classes," issued by the Library of Congress.

B Philosophy.
BF Psychology.
G Geography, voyages, travel.
GA Mathematical and astronomical geography.
GB Physical geography.
GC Oceanology and oceanography.
GF Anthropogeography.
GN Anthropology. Somatology. Ethnology. Ethnography. Prehistoric archæology.
GR Folklore.
GT Manners and customs.
GV Sports and amusements. Games.
HC Economic history and conditions. National production.
HE Transportation and communication.
HF Commerce.
HM Sociology. General.
L Education.
M Music.
N Fine Arts.
P Philology and linguistics.
Q Science. General.
QA Mathematics.
QB Astronomy.
QC Physics.
QD Chemistry.
QE Geology.
QH Natural history.
QK Botany.
QL Zoology.
QM Human anatomy.
QP Physiology.
QR Bacteriology.
R Medicine. General.
S Agriculture. General.
SB Field crops. Horticulture. Landscape gardening. Pests and plant diseases.
SD Forestry.
SF Animal culture. Veterinary medicine.
SH Fish culture and fisheries.
SK Hunting. Game protection.
T Technology. General.
TA Engineering—General.
TC Hydraulic engineering.
TD Sanitary and municipal engineering.
TE Roads and pavements.
TF Railroads.
TG Bridges and roofs.
TH Building construction.
TJ Mechanical engineering.
TK Electrical engineering and industries.
TL Motor vehicles. Cycles. Aeronautics.
TN Mineral industries. Mining and Metallurgy.
TP Chemical technology.
TR Photography.
TS Manufactures.
TT Trade.
TX Domestic science.
U Military science. General.
V Naval science. General.

Dewey Classification

The main divisions of the Dewey Decimal Classification, used in many libraries and by many individuals, is given below for the convenience of those who wish to use this system:

000 GENERAL WORKS—
010 Bibliography
020 Library economy
030 General cyclopedias
040 General collected essays
050 General periodicals
060 General societies
070 Newspapers
080 Special libraries. Polygraphy
090 Book rarities
100 PHILOSOPHY—
110 Metaphysics
120 Special metaphysical topics
130 Mind and body
140 Philosophical systems
150 Mental faculties. Psychology
160 Logic
170 Ethics
180 Ancient philosophers
190 Modern philosophers
200 RELIGION—
210 Natural theology
220 Bible
230 Doctrinal. Dogmatics. Theology
240 Devotional. Practical
250 Homiletic. Pastoral. Parochial
260 Church. Institutions. Work
270 Religious history
280 Christian churches and sects
290 Ethnic. Non-Christian
300 SOCIOLOGY—
310 Statistics
320 Political science
330 Political economy
340 Law
350 Administration
360 Associations. Institutions
370 Education
380 Commerce. Communication
390 Customs. Costumes. Folklore
400 PHILOLOGY—
410 Comparative
420 English
430 German
440 French
450 Italian
460 Spanish
470 Latin
480 Greek
490 Minor languages
500 NATURAL SCIENCE—
510 Mathematics
520 Astronomy
530 Physics
540 Chemistry
550 Geology
560 Paleontology
570 Biology
580 Botany
590 Zoology
600 USEFUL ARTS--
610 Medicine
620 Engineering
630 Agriculture
640 Domestic economy
650 Communication. Commerce
660 Chemical technology
670 Manufactures
680 Mechanic trades
690 Building
700 FINE ARTS—
710 Landscape gardening
720 Architecture
730 Sculpture
740 Drawing. Decoration. Design
750 Painting
760 Engraving
770 Photography
780 Music
790 Amusements
800 LITERATURE—
810 American
820 English
830 German
840 French
850 Italian
860 Spanish
870 Latin
880 Greek
890 Minor languages
900 HISTORY—
910 Geography and travels
920 Biography
930 Ancient history
Modern
940 Europe
950 Asia
960 Africa
970 North America
980 South America
990 Oceanica and polar regions

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Anniversaries of Science

March 17, 1853.—Christian Doppler died. He was a professor of mathematics at Prague. In 1842 he presented a paper on the colored light of double stars which enunciated the well-known principle which bears his name.

We have only to compare the dark-line spectra of the sun and stars with the bright-line spectra of the chemical elements, as we may easily produce them in the laboratory, to find, line for line, and in many cases even line-intensity for line-intensity, the evidences of the existence of these elements in sun and stars. The laboratory spectrum we may compare to a photographic positive, the solar and stellar spectra to negatives of the same subject. Yet though the reversal is unmistakable, there are small but highly significant differences in positions and intensities of the spectrum lines which add wonderful chapters to the story.

First there is the "Doppler effect," so-called after Christian Doppler, professor of mathematics at Prague, who pointed out in 1842 that the precise color of a shining body, like the exact pitch of a sounding one, must be changed by velocity of approach or recession. Doubtless all have heard the change of pitch of a locomotive whistle as it passes a crossing, and noticed it higher as it comes, lower as it goes away, because more vibrations reach the ear per second while the locomotive approaches, and less while it recedes. The same sort of thing holds for light, except that since light travels so exceedingly fast, more than 700,000 times as fast as sound, it takes a very high velocity of a luminous body to make any effect of this kind that can be noticed. However, the speed of the sun towards the stars of the constellation Hercules, about 12 miles a second, and the difference of over 2 miles a second between the speed of approach and recession of the sun's western and eastern edges, due to the sun's rotation on its axis, are easily measureable.

—Abbot: *The Earth and the Stars.*

March 18, 1907.—Marcellin Pierre Eugene Berthelot died. He was professor of organic chemistry in the College de France and secretary to the Paris Academy of Sciences. He made important researches in thermo-chemistry, explosives, and synthetic chemistry.

One of the characteristic Phenomena accompanying a chemical change is an evolution or absorption of heat; in other words, the amount of heat contained by the reacting system changes with the chemical change. The measurement of this heat change, which may range from a large negative quantity through zero to a large positive quantity, is the province of thermo-chemistry. Our knowledge of these heats of reaction is largely due to Thomsen and to Berthelot, each of whom started from the supposition that the heat effect is a direct measure of relative affinity; and it was with this end in view that they carried out the very laborious work involved in these determinations. It is now clear that this supposition is erroneous, that the maximum work producible by a reaction, or its free energy, is a truer measure of affinity, the heat effect being an important factor in this maximum work or free energy.

—Johnston: *Chemistry in The Development of the Sciences.*

March 20, 1727.—Sir Isaac Newton died.

Here Lies
SIR ISAAC NEWTON, KNIGHT,
Who by a vigor of mind, almost supernatural,
First demonstrated
The motions and figures of the Planets,
The Paths of the Comets, and the
Tides of the Ocean.
He diligently investigated
The different refrangibilities of the Rays of Light
And the properties of the Colors to which they give rise.
An Assiduous, Sagacious, and Faithful Interpreter
Of Nature, Antiquity, and the Holy Scriptures,
He asserted in his Philosophy the Majesty of God, and exhibited in his Conduct the simplicity of the Gospel.
Let Mortals rejoice that there has existed such and so great
An ornament of the Human Race.
Born 25 Dec., 1642; Died 20 March, 1727.

—*Inscription on Newton's monument in Westminster Abbey.*

Science News-Letter, March 12, 1927

ARCHÆOLOGY

King's Funeral in Ur Find

A fragment of carved limestone is one of the most important finds just announced from ancient Ur of the Chaldees where excavations are being made by a joint expedition of the University of Pennsylvania and the British Museum.

A report just received from C. Leonard Woolley, director of the expedition, states that this remarkable bas relief probably represents the funeral procession of a prehistoric king.

"The relief," he states, "shows a chariot drawn by four lions. It is empty, and the reins are held by a man who walks behind, while another guides the way in front and a third follows carrying some kind of burden. Over the car is thrown a leopard's skin, and to the front of it are tied spears, a quiverful of arrows, and a battle-axe, the panoply, perhaps, of the dead ruler. It is an extraordinarily interesting fragment."

Mr. Woolley's latest discoveries have been made at a cemetery older than any of the houses which have been uncovered at Ur. The latest of the graves in the main cemetery date back to before 3000 B. C., more than 1,000 years before Abraham lived in the city. The oldest of the graves, which lie 15 to 20 feet below the surface, are said by Mr. Woolley to be some 500 years older.

Science News-Letter, March 12, 1927

PSYCHOLOGY

Twelve-Day Noise Test

A noisy office makes a slow stenographer. This is one of the conclusions which may be drawn from the twelve-day noise test in progress at the psychological laboratory of Colgate University.

Every day for two weeks, Miss Elsie Keller, speed typist, has been pounding out letters while a noise machine manufactured office and street sounds within five feet of her chair. Half the time she worked in a laboratory where the sounds echoed and vibrated around the room. The other half, the brick walls of the laboratory were covered todeaden the vibrations to about half their original strength.

Dr. Donald Laird, professor of psychology at Colgate, who conducted the experiment, finds that an expert typist may be able to keep her accuracy at high pitch even when a room is full of noise and confusion. But the greater effert required drains her energy, and slows down her speed. Final results are expected to show considerable differences between typing done in noisy conditions and that done in comparative quiet.

"The hardest work I ever did," is Miss Keller's comment on the ordeal of typing steadily at around 100 words a minute to the tune of automobile horns, telephone bells, and sounds resembling office typewriters and office conversation.

Dr. Laird declares that at the noisiest, his laboratory is no worse than many offices where typists regularly spend their working hours.

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PSYCHOLOGY

Parents Poor Judges

The ratings given by parents and friends are of little use in judging the ability of students to do college work, according to Dr. E. L. Clark, director of admissions at Northwestern University. The filling out of information blanks by parents or friends has proved to be of little value in determining whether these students would be able to keep up to college standards if admitted, he says. Neither does the age of a student at entrance, nor the nationality of his parents have much relationship to grades. Of more value is information concerning failures the student may have made in high school, especially in courses required of college freshmen, though standing in the smaller schools is not so much to be depended upon as standing in the larger schools. Information concerning the number of high schools attended is also of value.

Science News-Letter, March 12, 1927

The Problem of Translation—

¶Science, probing the unknown universe, writes its findings in cryptic language. A stellar galaxy shining faintly in the heavens hides its splendor and its immensity in numbers and formulæ; a minute germ has thrust upon it a long Latin name. With the aid of such scientific shorthand and such technicalities, science pushes on to new discoveries and new heights.

¶Yet the facts and the methods of science must penetrate and permeate the whole fabric of civilization if the world is to become an increasingly better place to live in. The man in the street, the child in the school, the merchant in the counting house, the judge on the bench, the priest in the temple, all of those who make the world, must know, appreciate, understand and cherish the spirit of research and the power of thought.

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